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MONTANA GROUND WATER MONITORING AND INFORMATION AQUISITION PLAN

EXECUTIVE SUMMARY

Prepared for the Environmental Quality Council
by the Ground Water Data Task Force

May, 1990

BACKGROUND OF THE GROUND WATER MONITORING AND INFORMATION ACQUISITION PLAN

During the 1990-1991 biennium the Environmental Quality Council (EQC) has conducted an interim study of ground water quality protection and management issues as required by Senate Joint Resolution 22. The EQC initiated the SJR 22 study with the explicit presumption that important ground water information necessary to support basic management and regulatory decisions in Montana is either lacking or inaccessible. In the fall of 1989 the EQC appointed a 14-member Ground Water Data Task Force to evaluate existing ground water data, identify the most important data deficiencies, and develop a plan for obtaining the missing information and making existing information more accessible to users.

The Ground Water Task Force is comprised of representatives of the following units of government: 1) state agencies, including the Department of State Lands, Department of Natural Resources and Conservation, Department of Health and Environmental Sciences, Department of Agriculture, and the Montana State Library, Natural Resource Information System; 2) the university system, including the Montana Bureau of Mines and Geology (MBMG) and Montana State University; 3) federal agencies, including the U.S. Geological Survey (USGS), Bureau of Land Management, Forest Service, and Soil Conservation Service; and 4) local government, including the Fort Peck Tribes and the Missoula County Department of Health. The task force met five times between October 1989 and May 1990. This executive summary and the accompanying technical report present the task force's findings and recommendations.

GROUND WATER DATA TASK FORCE FINDINGS AND CONCLUSIONS

1. **Information on ground water hydrology and quality serves the following public and private purposes: water quality protection, water supply management, regulatory programs, public education, identification of vulnerable aquifers, protection of private water wells, operation of public water supplies, business development, water well drilling, and irrigation.** For most of these purposes, ground and surface water are closely interconnected and cannot be effectively evaluated or managed in isolation. Ground water quality and supply are also closely interrelated in many locations.

2. **Where ground water data are lacking, important questions cannot be answered with any degree of certainty.** Examples of such questions include: Why are water levels declining? Is an adequate supply of water available? How will recent or proposed withdrawals affect existing wells and water rights? Is the water safe to drink? Who polluted the water and when? What is the most effective clean-up strategy? What is the rate and direction of water flow? Where is the recharge area? What is the natural water quality?

3. The EQC received testimony on numerous ground water-related issues this biennium, including declining water quality in the Missoula and Helena valley aquifers, leaking landfills and new ground water monitoring requirements, leaking underground storage tanks, cyanide use in gold mining operations, detection of pesticides in ground water, ground water clean-up plans at the Burlington Northern's Livingston site, and ground water contamination caused by sewage disposal and failed septic systems. **A common theme underlying most of these issues is the need for basic information about aquifer characteristics and water quality in order to**

improve the ability of citizens and government agencies to prevent ground water contamination.

4. **Ground water data deficiencies consistently hamper water appropriations and water rights permitting decisions** because effects of new water withdrawals on other water users and ground and surface water interactions cannot be adequately assessed. Water use activities also have an effect on water quality, but water rights permitting decisions are made without this information.

5. **Ground water has not been systematically evaluated in Montana.** The locations of previous ground water studies containing one or more data elements included the Task Force's proposed ground water characterization program (discussed below) are shown on Figure 1. As Figure 1 illustrates, the characteristics of aquifers in substantial portions of the state were not previously studied nor were past studies conducted with the idea of producing a comprehensive statewide ground water data base. Some portion of the information produced by the studies shown on Figure 1 may be suitable for inclusion in a new data base, but much of the information may be outdated or primarily useful for comparison with more recent information.

6. **Most of the information produced by ground water investigations <u>other</u> than those shown on Figure 1 is not applicable to most ground water management and protection decisions for some combination of the following reasons:**

-- the studies concentrated on problem situations such as saline seep and the behavior of contaminants in the subsurface rather than evaluation of the ground water resource;

-- the studies were done on a short-term, one-time basis and were not of sufficient duration to reflect year-to-year changes in aquifer flow and direction, or in some instances, seasonal changes;

-- only one aquifer was studied rather than all of the potentially usable aquifers in a particular study area;

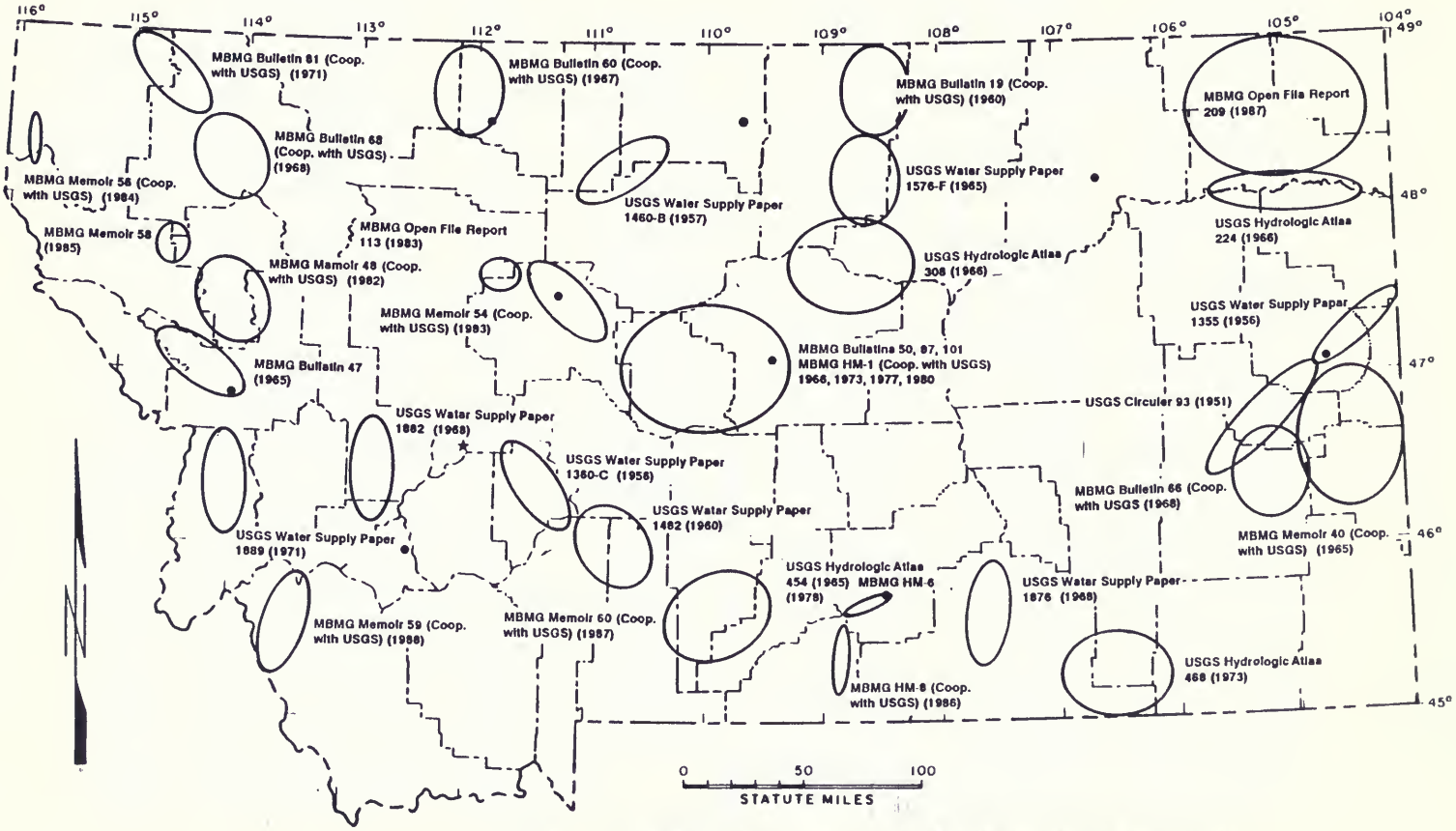
-- study results are incompatible or difficult to compare due to differences in emphasis or because different parameters were assessed;

-- aquifers were not evaluated for regional variability;

-- the study results were either too site-specific or too regional in scale; and

-- shallow alluvial aquifers that are generally the most vulnerable to contamination were not addressed.

7. **Efforts to monitor ground water levels and natural water quality over the long-term have been generally weak and fragmented.** There is very little statewide information available, although there is more static water level data than ground water quality information. The total average annual state funds spent for long-term ground water monitoring on a relatively stable basis is $31,150. **There is a significant need for a more comprehensive long-term monitoring record to measure on-going changes in ground water supply and quality.**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MBMG Bulletin 81 (Coop. with USGS) (1971)
MBMG Bulletin 68 (Coop. with USGS) (1968)
MBMG Memoir 56 (Coop. with USGS) (1984)
MBMG Memoir 58 (1985)
MBMG Bulletin 47 (1965)
MBMG Memoir 48 (Coop. with USGS) (1982)
MBMG Open File Report 113 (1983)
MBMG Bulletin 60 (Coop. with USGS) (1967)
USGS Water Supply Paper 1460-B (1957)
MBMG Memoir 54 (Coop. with USGS) (1983)
MBMG Bulletins 50, 87, 101 MBMG HM-1 (Coop. with USGS) 1968, 1973, 1977, 1980
USGS Water Supply Paper 1882 (1968)
USGS Water Supply Paper 1360-C (1958)
USGS Water Supply Paper 1482 (1960)
USGS Water Supply Paper 1889 (1971)
MBMG Memoir 59 (Coop. with USGS) (1988)
MBMG Memoir 60 (Coop. with USGS) (1987)
MBMG Bulletin 19 (Coop. with USGS) (1960)
USGS Water Supply Paper 1576-F (1965)
USGS Hydrologic Atlas 308 (1966)
USGS Hydrologic Atlas 454 (1965) MBMG HM-6 (1978)
MBMG HM-8 (Coop. with USGS) (1986)
MBMG Open File Report 209 (1987)
USGS Hydrologic Atlas 224 (1966)
USGS Water Supply Paper 1355 (1956)
USGS Circular 93 (1951)
MBMG Bulletin 66 (Coop. with USGS (1968)
MBMG Memoir 40 (Coop. with USGS) (1965)
USGS Water Supply Paper 1876 (1968)
USGS Hydrologic Atlas 468 (1973)
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Figure 1: Schematic locations of ground-water studies published between 1950 and 1990 that contain one or more aspects of an aquifer characterization.

8. Systematic collection of ground water data will not provide immediate answers or the means to resolve all of the state's ground water issues. The information also will not be a substitute for the detailed, site-specific work required to site a new mine or a landfill nor will it necessarily answer specific questions individual citizens may have about ground water hydrology or quality underlying their property. Instead **the goal of the ground water monitoring and information acquisition plan is to generate data that will improve ground water protection and management decisions over the long term.**

9. **The expense of ground water cleanup operations and the difficulty of achieving acceptable results present the strongest possible argument for a shift in emphasis to programs that prevent contamination. Prevention goals cannot be met without better statewide data concerning aquifer characteristics and ground water quality.**

MONTANA GROUND WATER MONITORING AND INFORMATION ACQUISITION PLAN

Based on the above findings and conclusions, the Ground Water Data Task Force proposes the "Montana Ground Water Monitoring and Information Acquisition Plan", which consists of two proposed programs: a baseline ground water monitoring program and a ground water characterization program. Other issues addressed by the plan include interagency coordination, data management, public involvement and education and options for funding the proposed programs.

PROPOSED BASELINE GROUND WATER MONITORING PROGRAM

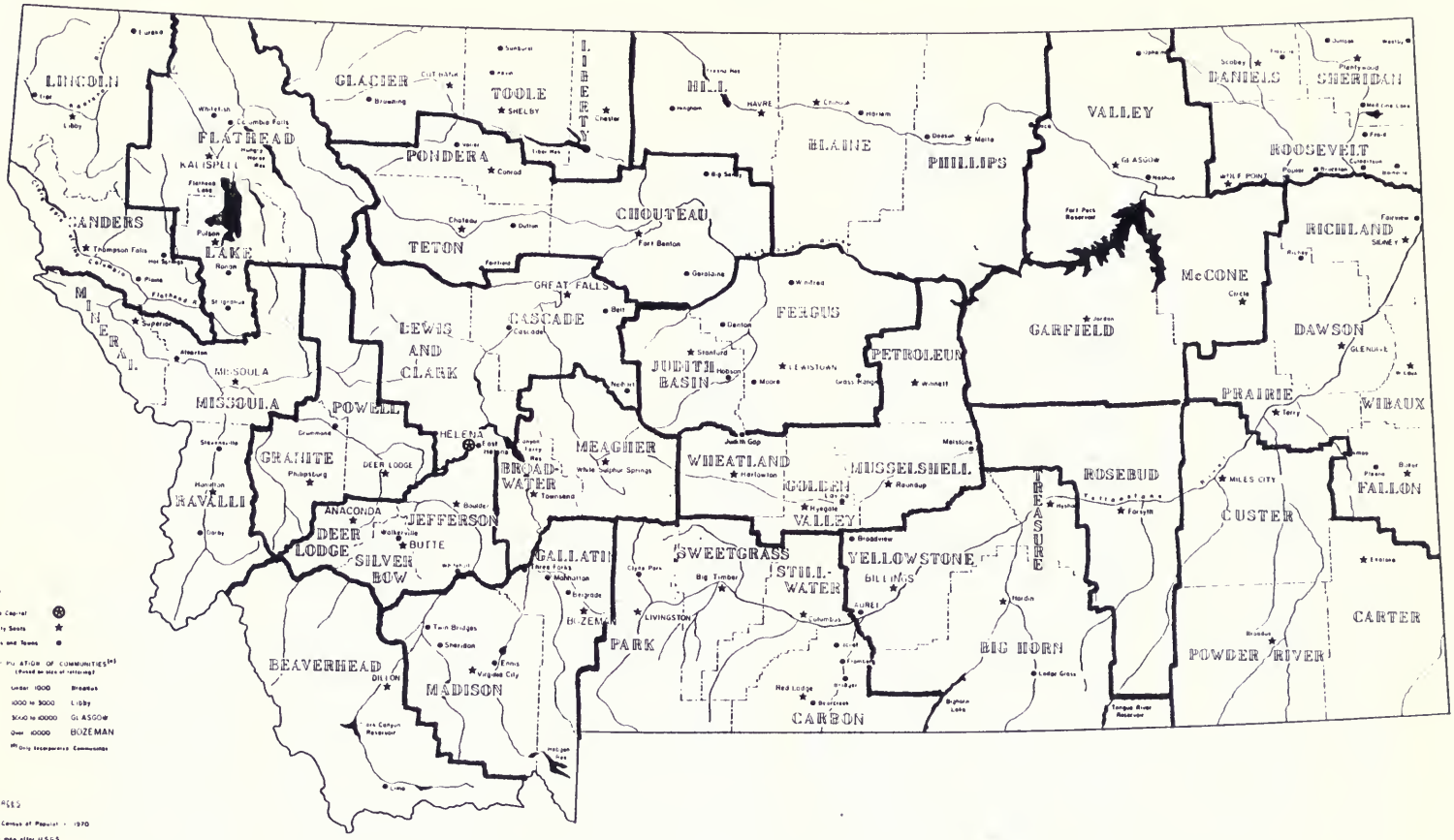
> **Recommendation: The Ground Water Data Task Force recommends that a baseline ground water monitoring program be established to record water chemistry and static water levels on a long-term basis through a statewide network of observation wells.**

Program Description

Baseline ground water data are used to define hydrogeologic conditions and background quality of water in an aquifer. This information is useful in resolving questions about the overall magnitude and frequency of changes in water levels in the aquifer and trends in water quality.

The proposed baseline ground water monitoring program would concentrate on shallow aquifer systems but would also include some deeper aquifers that are widely used in eastern Montana. The Ground Water Data Task Force suggests an allocation of 730 monitoring wells among the major aquifer groups in the state. Observation wells could be either privately or publicly-owned water wells or special monitoring wells drilled specifically for the program. Construction of new monitoring wells would be done only as a last resort if there are no suitable existing wells in an area considered critical for obtaining information about a particular aquifer. For the most part the observation wells would be selected from existing monitoring programs and inventories of wells and well logs on file in agency data bases.

The program would consist of quarterly water level measurements on each well, with continuous recorders installed on 10 percent of the wells. Water quality samples would be collected from 10 percent of the wells (about 70 wells) annually.



STATE OF MONTANA

Figure 2: Ground Water Characterization Study Areas

Water quality monitoring would include analysis of inorganic parameters and selected organic parameters for aquifers considered vulnerable to contamination.

The projected cost of the proposed baseline ground water monitoring program is $343,136 per biennium. About $22,000 of this amount is currently allocated to ground water monitoring under the cooperative water research program administered by the USGS and the MBMG.

PROPOSED GROUND WATER CHARACTERIZATION PROGRAM

> **Recommendation: The Ground Water Data Task Force recommends that a ground water characterization program be established to systematically assess Montana's ground water on a statewide basis.**

There is no mandate in Montana statutes for a program to systematically assess the state's ground water. While existing law does not prohibit or discourage agencies from initiating aquifer studies, the lack of a specific directive to any one agency to implement an organized program and lack of specific funds for this purpose has hampered progress in achieving a better understanding of the ground water resource. **The goal of the proposed ground water characterization program is to study all of Montana's major aquifers over the next 10 to 15 years and to provide data that are useful to all agencies with ground water management and protection responsibilities.**

Prioritization of Aquifers

> **Recommendation: The Ground Water Data Task Force recommends that the EQC select two areas of Montana to be the subjects of the first studies under the proposed ground water characterization program during the 1992-1993 biennium.**

Figure 2 depicts 21 potential study areas that would be evaluated under the proposed ground water characterization program. The Ground Water Data Task Force identified these areas by matching drainage basin boundaries to county boundaries as much as possible and by grouping geologically similar areas together.

Figure 3 is a composite, "aquifer prioritization" map that the Ground Water Data Task Force developed to identify areas where ground water characterization is most needed. Figure 3 reflects two primary aquifer prioritization criteria: 1) vulnerability to contamination and/or declining water supply; and 2) functional importance of the aquifer in terms of current and potential future use. **The areas of Montana that receive highest priority for ground water characterization studies are the western Montana basins and the eastern Montana river valleys, primarily because these areas are where the most people live, where activities involving use of contaminant substances are greatest, and where aquifers tend to be generally shallow and most vulnerable to pollution.**

Table 1 identifies six study areas that the Ground Water Data Task Force selected as candidates for priority consideration by the EQC if the proposed ground water characterization program receives the Council's endorsement. Table 1 also includes a brief listing of the circumstances in each area that are most responsible for the

Table 1

High Priority Study Areas
for the Ground Water Characterization Program

Study Area Location	Reasons Supporting Priority Ranking
Fallon-Prairie-Dawson-Wibaux-Richland	public water supplies rely on ground water; contaminant sources, including oil and gas development and agriculture
Hill, Phillips, Blaine	surface/ground water interaction; potential aquifer depletion; lack of data; aquifers geologically vulnerable to contamination; limited drinking water supplies; international water transfer issues
Sweetgrass, Stillwater, Carbon, Park	significant use of alluvial aquifer; high quality surface water; contamination sources, including agriculture, residential development, and commercial/industrial activity
Ravalli, Missoula, Mineral	large municipal ground water supply; contamination sources, including intensive residential development and associated water well drilling, commercial and industrial sites, agriculture; surface/ground water interaction; potential for streamflow depletion
Beaverhead	surface/ground water interaction; potential for streamflow depletion; lack of data
Flathead, Lake	surface and ground water interaction; contamination sources, including residential development and agriculture; federal reserved water rights issues; intensive ground water-based irrigation

high priority ranking.

Other criteria that should be considered in the selection of priority aquifers include: the seriousness of the health threat posed by certain types of contaminants and the extent of use of these contaminants; aquifers that are of highest current ambient quality; areas where ground water problems are occurring or are considered likely to occur; the functional importance of an aquifer to surface water hydrology and quality; aquifers that are both vulnerable to contamination and important for a variety of uses but that have not been previously studied; the level of local interest in and support for ground water characterization; and aquifers that are sole sources of drinking water.

Program Description

Once an area is selected for a ground water characterization study, all of the aquifers currently used or potentially usable in the study area would be included, although more emphasis would be given to those aquifers considered most vulnerable to contamination (i.e., the shallower aquifer systems). Since surface water and shallow ground water are closely connected, the ground water characterization studies would also include analysis of surface/ground water interactions. Each completed study would include the following series of map topics and a narrative report: published literature base map, surface and bedrock geologic maps, geologic cross-sections, aquifer characteristics map, water quality map, land use inventory map, water well inventory map, water table map, and aquifer assessment map.

The proposed ground water characterization program would focus on the collection of basic hydrogeological, water quality, water use and land use data and interpretation of the information in order to determine aquifer characteristics such as flow direction, recharge-discharge patterns, and cause-effect patterns related to water withdrawals and surface-ground water interactions. The land use inventory would primarily consist of verifying the locations of point and potential nonpoint sources of ground water contaminants. Water quality analyses would include sampling for common ions, inorganic chemicals, metal ions, and nutrients. In areas where there is particular concern about the possible presence of contaminants, the work would also include sampling for those substances as funds permit.

Each ground water characterization study would require approximately three years to complete and would require the services of a principle hydrogeologist and a data manager. The estimated cost for an individual 3-year ground water characterization study ranges from $302,000 to $527,000. The range of costs reflects differences in study areas such as depth to water, availability of usable existing data, geologic characteristics, volume and diversity of comtaminant sources and other factors.

INTERAGENCY COORDINATION

Recommendation: The Ground Water Data Task Force recommends that an interagency steering committee be established to guide the proposed ground water characterization and baseline ground water monitoring programs and to ensure that the work performed under the programs is fully coordinated with ground water-related projects that individual agencies may be conducting. Specific duties of the steering

committee would include prioritizing aquifers for future ground water characterization studies and overseeing the selection of baseline monitoring wells. The steering committee should include representatives of the Department of Natural Resources and Conservation, Department of Health and Environmental Sciences, Department of Agriculture, Department of State Lands, MBMG, Natural Resource Information System, and the university system. Federal agencies such as the USGS, Bureau of Land Management, Forest Service, Soil Conservation Service, and Bureau of Reclamation should also be invited to participate.

Interagency coordination is a critically important component of the proposed ground water characterization program. Some of the inadequacies of existing ground water data and problems hampering data access can be traced to the historic lack of interagency coordination of ground water programs. Agencies have mainly tended to cooperate on a project-specific or site-specific basis where issues involving separate agency jurisdictions have arisen. Systematic study of the ground water resource has not been fostered by this arrangement. If the proposed ground water characterization and baseline ground water monitoring programs are initiated, many agencies have a legitimate interest in participating on a continuing basis to ensure that the programs meet their needs.

PROGRAM ADMINISTRATION

Recommendation: The Ground Water Data Task Force recommends that the MBMG be assigned primary administrative responsibility for the ground water characterization and baseline monitoring programs, subject to the guidance provided by an interagency steering committee.

The MBMG has statutory responsibility for conducting studies, compiling statistics and publishing reports concerning Montana geology, including hydrology. The Ground Water Information Center is housed at the MBMG and is the repository for a substantial portion of existing Montana ground water data. MBMG staff have been responsible for many ground water field investigations and have performed work under contract or in cooperation with virtually all other state and federal gencies that are responsible for ground water programs in Montana.

DATA MANAGEMENT

Recommendation: The Ground Water Data Task Force recommends that if the 1991 Legislature approves the proposed baseline monitoring and ground water characterization programs, the resulting information should be entered into a Geographic Information System. A data collection and management system that ensures a reliable data base and that is satisfactory to the interagency steering committee should be implemented.

Numerous problems have historically hampered user access to ground water data in Montana. Mechanisms needed to make existing data easily computer-accessible to users are not yet in place. Other data management issues that need to be resolved include differences in map scales among various sets of data, loss of data accuracy through conversion to a GIS, inconsistency in quality of ground water data,

and the need for uniform standards for ground water data collection, analysis and recording. Data resulting from the proposed programs should be made available in both written reports and a GIS, and on-line access to the information should be readily available to any interested user who possesses the necessary computer hardware and software.

PUBLIC EDUCATION AND INVOLVEMENT

> **Recommendation: If an interagency ground water data steering committee is created, the Ground Water Data Task Force recommends that this group be responsible for identifying ways to heighten public awareness of ground water issues and improve government's efforts to educate the public about ground water. The Ground Water Data Task Force also recommends that the proposed baseline ground water monitoring and ground water characterization programs provide technical support and information to existing ground water education programs.**
>
> **Recommendation: The Ground Water Data Task Force further recommends that the MBMG establish communication with the public in each area selected for ground water characterization studies. Mechanisms should be established to provide for a mutual exchange of information between state agencies and local people to identify citizen concerns and to explain the goals and progress of the ground water characterization work.**

All existing and planned efforts to increase public awareness of the importance of ground water, the causes of ground water contamination, and options for reducing contamination risk should be encouraged. However, better interagency coordination of these programs is needed. Because the proposed ground water monitoring and ground water characterization programs would be focused on the study of the state's ground water resource as a whole, these programs would be in a unique position to contribute to the efforts of other agencies that are responsible for developing ground water information for the public.

Development of strong working relationships with local governments, water user associations, conservation districts, rural water districts, public water supply operators and other organizations with a special interest in ground water will be important to the success of individual ground water characterization studies and acceptance of the proposed ground water data programs. Local support and recognition of threats to ground water quality and supply may also be significant factors influencing the selection of areas for future study.

POTENTIAL FUNDING OPTIONS FOR GROUND WATER INFORMATION PROGRAMS

Approximately $893,000 to $1.27 million would be required to fund the proposed baseline ground water monitoring and ground water characterization programs the first biennium. This estimate reflects the range of costs for two ground water characterization studies and the portion of costs that would be incurred during the first two years, since each study would require three years to complete. **The proposed programs will require a stable, long-term source of funding.** Potential

revenue sources include reallocation of funds currently directed to other purposes, increases in the rates or levels of existing funding mechanisms, and creation of new mechanisms.

There is general agreement that the state will face a significant budget deficit for the 1992-1993 biennium. Therefore, state general fund revenues are probably not a realistic option for funding the proposed programs. Revenue could be collected from the general public based on the premise that everyone has a responsibility for ensuring that ground water is properly managed and protected and that everyone contributes to some degree to the demands and stress placed on ground water. Potential revenue mechanisms currently assessed on the general public include the gasoline tax, vehicle registration fees, and the cigarette tax. Another option that has already been the subject of a legislative research request is reallocation of a percentage of the resource indemnity tax. Revenue could be collected from specific sources of ground water contamination such as landfills, mining operations, oil and gas wells, pesticides, fertilizers, and hazardous wastes. Fees could also be assessed on ground water users. Table 2 summarizes some of the fees, taxes, and other revenue-raising mechanisms currently levied on contaminant sources as well as several new types of fees.

The funding mechanisms identified in this executive summary and in the accompanying technical report are presented for discussion purposes only and to identify the relative volumes of revenue currently or potentially involved. **The Ground Water Data Task Force did not attempt to prioritize or evaluate the mechanisms, but a partial listing of issues that need to be considered includes the following: 1) the administrative expense of collecting revenue from any new funding mechanisms; 2) current uses of the funds raised by existing fees and taxes; 3) the likelihood of other proposals in the 1991 Legislature to raise the rates of existing funding mechanisms or create the same "new" mechanisms identified in Table 3; 4) the political acceptability of raising the rates of any existing funding mechanisms or creating new ones; 5) the distribution and comparative rates of fees and taxes among the various sources of ground water contaminants; and 6) the volume of revenue some types of industry and businesses are already providing to support environmental and natural resource programs.**

LOCAL GOVERNMENT

If the proposed ground water characterization program is approved, the role of local governments must be defined. Local government involvement is desirable for many reasons and local financial support for ground water information programs has been a significant factor responsible for the success of similar efforts in other states. The issue of providing funding mechanisms for local governments to raise revenues to participate in ground water studies is particularly important.

FEDERAL AGENCIES

> Recommendation: If the proposed ground water characterization and baseline ground water monitoring programs are approved, the Ground Water Data Task Force recommends that immediate attention be directed toward opening a dialogue with the USGS, Bureau of Land Management, Forest Service, Soil Conservation Service, Environmental Protection Agency and Bureau of Reclamation to specifically identify

Table 2
Potential Revenues for Ground Water Data Programs

Funding Mechanism	Rate	Size or Volume of Affected Business	Current (or *Potential) Annual Revenue/1
Solid Waste			
Statewide tipping fee at landfills	$1 per ton	An estimated 500,000 tons per year of waste currently deposited in 115 landfills	$500,000*
Pesticides			
Surcharge on retail value of herbicides sold for farm and ranch use	1 cent per dollar	Based on records of about 500 retailers; excludes sales for home and garden use; surcharge collected from herbicide registrants	$400,000
Surcharge on retail value of insecticides sold for farm and ranch use	1 cent per dollar	Same as above	$ 70,000*\2
Registration fee	$90 per product	An estimated 4900 pesticides currently registered	$441,000
Surcharge on the retail value of pesticides sold for home and garden use	1 cent per dollar	About 2200 retailers\3	$185,000*\2
Retailer license fee	$45	About 1600 retailers selling pesticides for home and garden use\3	$ 72,000*\2
Commercial post and pole treatment facilities -ground water protection fee\4	$50	Average of 47 businesses licensed annually	$ 2,350*

Fertilizers			
Fertilizer distributor license	$75 initial fee; $50 annual renewal		$12,060\5
Fertilizer registration fee	$10 per fertilizer and soil amendment;\6 $25 for specialty fertilizers		$17,048\5
Fertilizer inspection fee	25 cents per ton		$78,455\5
Oil and Gas Production			
Ground water protection fee	$50 per producing oil and gas well	4841 wells in 1988/7	$242,050*
	$50 per salt water disposal well	184 active and 18 temporarily abandoned wells in 1989	$ 10,100*
Mining			
Cyanide use - ground water protection fee	2 cents per pound	12,000,000 pounds used annually\8	$240,000*
Coal production - special ground water protection fee	1 cent per ton	34,469,943 tons mined in 1989	$344,699*
Hazardous Waste Generators			
Registration fee	By class: I-$10; II-$75; III-$200; IV-$600; V-$1000; VI-$1500	I-102; II-143; III-16; IV-4; V-2; VI-2	approx. $23,000
Halogenated solvent user registration fee	$50 per user	193 users registered as of 3/90	$ 9,650*\9
Water Wells			
Water well construction fee	$50 per well	Average of 2221 new wells drilled annually\10	$111,050*

Table 2 Footnotes

1\All "new" funding mechanisms would involve additional administrative costs. Mechanisms that would apply to products or persons that are not currently part of the state's revenue collection system could be costly to administer. No attempt has been made in this table to calculate or account for these costs. "New" funding is designated by "*" in the right-hand column of the table.

2\Estimate prepared in consultation with Montana Department of Agriculture.

3\The total estimated number of retailers selling products defined as pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act is about 2200. If businesses that sell only disinfectants are subtracted, the number drops to 1600. These businesses are not included in the Montana Department of Agriculture's current revenue collection system; therefore, additional administrative costs would be incurred in collecting these fees.

4\This group of businesses is identified separately in Table 2 because the substances commonly used to treat posts and poles can threaten ground water but are classified as pesticides rather hazardous wastes. Therefore these businesses are not affected by fees paid by hazardous waste generators nor are they typically covered by pesticide sales fees, although they are required to be licensed and certified by the Montana Department of Agriculture.

5\Three-year annual average based on collections for 1987-89. Information reported in Table 2 did not identify the total number of distributors, number of fertilizer products, or tonnages sold.

6\An additional $10 was added to the fertilizer registration fee by HB 757, the Montana Agricultural Chemical Ground Water Protection Act. The revenues collected by that fee increase are not included in Table 2.

7\Includes underground injection wells used for enhanced recovery of oil (571 active enhanced recovery wells in 1989); does not include inactive, temporarily abandoned enhanced recovery wells (539 inactive wells in 1989). A $50 ground water protection fee assessed on the 539 inactive enhanced recovery wells would generate $26,950.

8\Estimate prepared in consultation with Montana Department of State Lands.

9\If a special halogenated solvent user fee were created, the businesses subject to the new fee should be defined in a manner that would allow them to pay either the new fee or the appliable existing hazardous waste generator fee but not both. Some halogenated solvent users currently are not subject to the hazardous waste generator fee structure.

10\This number is an average based on the total annual well logs filed with the Montana Bureau of Mines and Geology for the period of 1984-1989.

how their ground water programs and federal funding targeted for Montana can be coordinated with the state's efforts.

Cost-share arrangements can be made with the USGS to conduct part of the ground water information acquisition work and absorb up to 50% of some program expenses. The possibility of negotiating cost-share agreements with other federal agencies such as the Bureau of Land Management and Forest Service is less clear and is dependent upon federal revenue availability for ground water programs.

Ground water management and protection is currently receiving a great deal of national attention. Very little specific information is available about the level of potential increased funding support for federal agency ground water budgets, the specific activities or program components where additional funds would be channeled, and the level of funding that could reach Montana. The next two or three years may be a period of unprecedented opportunity for increasing ground water data collection and analysis in the state in partnership with federal agencies, particularly if Montana is willing to define its priorities and provide more support than in the past.

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